

## CLAIMS

1. A nonlinear controller comprising: a first module composed of a nonlinear system for creating a synchronous state with a controlled object through a nonlinear interaction with the controlled object; and  
a second module composed of a feedback system for adjusting a parameter to vary a relation value of the first module relating to the synchronization with the controlled object based on the difference between the relation value and a target relation value,  
wherein the controlled object is controlled by convergence of the relation value relating to the synchronization of the first module to the target relation value.
2. The nonlinear controller as recited in Claim 1, wherein the first module and the controlled object vibrate at different natural frequencies, and the nonlinear interaction has an entrainment effect.
3. The nonlinear controller as recited in Claim 2, wherein the relation value relating to the synchronization is the phase difference between the vibration of the controlled object and the vibration of the first module, and the parameter is the natural frequency of the first module.
4. The nonlinear controller as recited in any one of Claims 1 to 3, wherein the synchronous state between the first module and the controlled object is achieved through transmission and reception of rhythm.
5. The nonlinear controller as recited in any one of Claims 1 to 4, wherein the synchronous state between the first module and the controlled object is achieved through a radio wave or network.
6. A nonlinear control method comprising steps of: creating a synchronous state with a controlled object through a nonlinear interaction with the controlled object;

acquiring a state variable relating to the dynamic behavior of the controlled object;

adjusting a parameter for varying a relation value relating to the synchronization with the controlled object based on the  
5 difference between the relation value relating to the synchronization and a target relation value; and

creating a new synchronous state with the controlled object using the adjusted parameter.

7. A program readable by a controller for causing the controller  
10 to perform the nonlinear control method as recited in Claim 6.